

Installation Manual

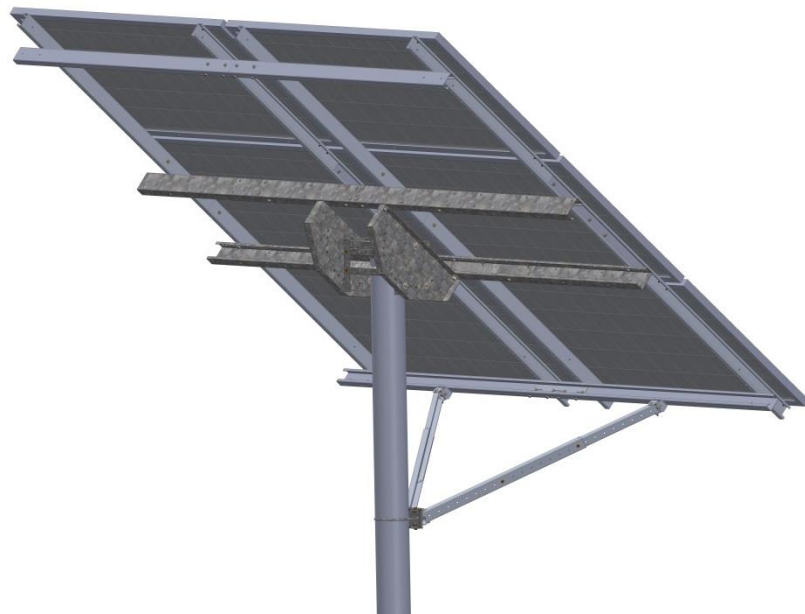
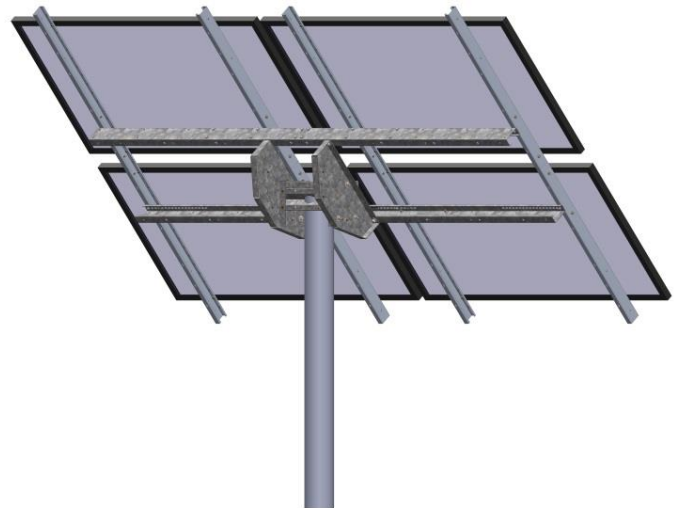
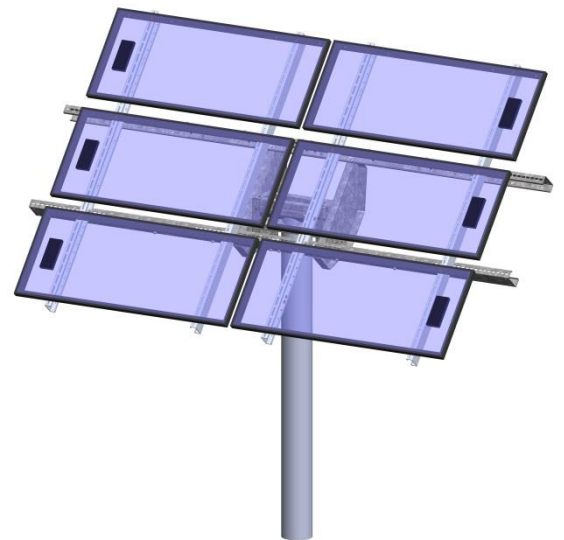
LTP-LSCR-MAN 2017 Edition v1.0

Formodels:

LTP-SCR/070

LTP-LCR/090

LTP-LCR/120





LTP Mount Series

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Introduction

The Top of Pole Mount is an extremely sturdy, universal pole mounting solution for small area solar photovoltaic (PV) needs. With its user adjustable angle settings (0° to 50° in 10° increments), the Top of Pole Mount can support installations in a wide range of locations.

Customer Support

Tamarack Solar makes every effort to ensure your mounting kit is easy to install. If you need assistance at any point in your installation or have suggestions on how we can improve your experience, call customer support at **1-800-819-7236** or email us



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Tools Required

Tools that support the following size hex heads: Torque values are “dry”, add 15% if using anti-seize lubricant on **stainless** hardware (Recommended). Deep sockets for 5/16” and 1/2”, long combination wrench for 5/16.

1. 1/2” = 480\40 In\Ft Lbs
2. 3/8” = 240\20 In\Ft Lbs
3. 5/16” = 144\12 In\Ft Lbs
4. 1/4” = 84\7 In\Ft Lbs

Components List The following parts are for all the **LTP** mount models:

Galvanized coated sheet steel components will show rust on cut edges and is normal and will not affect the structure and function of the mount.

COMMON TO ALL LTP MOUNTS, LTP-SCR-070, LTP-LCR-090, LTP-LCR-120			
PART NUMBER	DESCRIPTION	QTY.	
51-07PC-017	Clamp Half, 6" Pipe	2	
51-07CH-017	Clamp Strong Back Cap	1	
51-07BC-TLT	Channel, Tilt Plate Mounting	2	
51-07TP-LR2	Tilt Plate L\R	2	
51-07SP-060	Cross Rail Connector	2	
23-2520-050	Bolt, 1/4-20 x .75 SS	40	Qty's Vary by model
25-2502-000	Washer, flat 1/4 SS	40	Qty's Vary by model
25-2501-014	Nut, Flange Serrated 1/4-20 SST	40	Qty's Vary by model
51-0756-890	Rod, threaded, SST 5/16-18 x 8.9" long	4	
23-3118-875	Bolt, Hex 5/16-18 x .875 SST	44	Qty's Vary by model
25-3102-000	Washer, flat 5/16" SS	44	Qty's Vary by model
25-2501-015	Nut, flange 5/16 SST	60	Qty's Vary by model
23-3716-100	Bolt, 3/8-16 x 1.0 Hex SST.	40	Qty's Vary by model
25-3702-000	Washer, Flat 3/8" SST.	48	Qty's Vary by model
25-3701-000	Washer, lock 3/8" SST.	8	Qty's Vary by model
25-2501-016	Nut, Flange Serrated 3/8-16 SST.	32	Qty's Vary by model
24-3716-440	Nut, 3/8-16 Hex SST.	8	Qty's Vary by model
23-5013-125	Bolt, 1/2-13 x 1.25" Galv	10	
25-5002-GLV	Washer, Flat 1/2" Galv	20	
25-5001-GLV	Washer, Lock 1/2" Galv	10	
24-5013-GLV	Nut, 1/2-13 Galv	10	
LTP MOUNT SPECIFIC		model	
51-07CR-058	Cross Rail, 58 Inch	4	LTP-SCR-070
51-07CR-066	Cross Rail, 66 Inch	4	LTP-LCR-090, LTP-LCR-120
51-04TC-045	Panel Support, 45"	8	LTP-LCR-090
51-07TC-060	Panel Support, 60"	8	LTP-LCR-120
51-07TC-070	Panel Support, 70"	4	LTP-SCR-070



Pre Assembly for Models LTP-LCR/090, LTP-LCR/120

Step 1: Connecting Panel Support Channels

- A. Lay two panel support channels end to end with a connector in the middle.
- B. Using a connector, bolt the panel support channels together. Tighten the 5/16-18 x 7/8" hardware (hex bolt, flat washer, and flange nut) to 144 in-lbs (dry). **(Detail A)** Repeat with the remaining set of channel rails and set aside.

Step 2: Connecting Cross Rails LTP-SCR/070, LTP-LCR/090, LTP-LCR/120

- A. Lay two cross rails end to end with a connector in the middle.
- B. Using a connector, bolt the cross rails together. Tighten the 3/8-16 x 1" hardware (hex bolt, flat washer, and flange nut) to 20 ft-lbs (dry). **(Detail B)** Repeat with the remaining set of cross rails and set aside.

Step 3: Connecting Knee Brace Channels LTP-LCR/120

- A. Lay two knee brace channels end to end with a connector in the middle.
- B. Using a connector, bolt the knee brace channels together. Tighten the 5/16-18 x 7/8" hardware (hex bolt, flat washer, and flange nut) to 144 in-lbs (dry). **(Detail C)** Repeat with the remaining set of knee brace channels and set aside.

Step 4: Connecting Modules to Panel Supports

3 modules per tier, connect middle panel only, 2 modules per tier, connect both

- A. Lay a module on flat surface, frame side up.
- B. Lay panel supports across the module with obround slots down, and the open sides facing towards the center of the module, aligning the mounting holes of the module with the obround slots on the panel supports, placing the module in the center (3 module tier shown) **(Detail D)** or equally spaced (2 module tier). Install with 1/4 x 3/4 bolts, flats and flange nuts, tighten only enough to hold firmly, **do not torque at this time.**

Final Assembly

Step 5: Attach Pole Clamp Assembly to Pole

- A. Slide the pre-assembled pole clamp over the pole, the assembly should rest on the notches on the top edge of the pole. **(Detail E)**.
- B. Loosen the four 1/4" bolts slightly to allow the clamp halves to tighten up on the pole.
- C. Orientate brace to face south.
- D. Tighten the 8 outside 5/16 flange nuts on the threaded rods evenly, making sure that each nut is tightened the same amount of turns so the distance between the clamp halves is the same on each side of the pole, until the torque setting is reached. 144 in-lbs (dry).
- E. Finger tighten the 8 inside 5/16 flange nuts up to the flanges of the clamp halves.
- F. Using a long 5/16 box wrench, tighten 5/16 flange nuts, alternating turns from side to side, pulling the flanges together. (Close or touching, not flattened out).
- G. Install 5/16 x 7/8 bolt, flat, and flange nuts in the 4 holes of the clamp halves flange ends. Tighten 5/16 bolts, alternating turns from side to side, pulling the flanges together. (close or touching, not flattened out) **(Detail F)**.



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- H. Check the torque of the 8 outside flange nuts, re torque as needed.
- I. Torque the four 1/4" bolts on top to 84 in-lbs. **(previously loosened slightly)**
- J. **(Optional)** caulk the seams on top of pipe clamp to seal preventing rain water entering the pipe.

Step 6: Attach Tilt Plate Mounting Channel

- A. Place tilt plate mounting channels on the sides of the pole clamp assembly **(Detail G)**.
- B. Install 1/4" bolt, flat and flange nuts 6 places on both sides, tighten to 84 in-lbs. Note: placing the flange nut in the "closed" side of the wrench to align with the bolt through the cutout will make it easier to start. **(Detail H)** Dropped nuts cannot be retrieved very easily.

Step 7: Attach Tilt plates

- A. Attach tilt plates, flanges facing to the outside using 1/2-13 x 1.25 bolts, flats, locks and nuts; position the tilt plates with the top parallel to the ground (0°). Do not torque at this time, tighten only enough to hold firmly for next assembly steps. **(Detail I)**.

Step 8: Attach Cross Rails to Tilt Plates.

- A. Attach cross rails to the tilt plates, open sides facing to the inside, (CENTERED) using 1/2-13 x 1.25 bolts, flats, locks and nuts. Torque to 40 ft-lbs. **(Detail J)**

Step 9: Attach Panel Support Sub Assembly to Cross Rails

- A. Lean the sub assembly against the cross rail **(Detail K)**, to left side, lift the end up and slide sub assembly onto both cross rails and place in center, drop four 3/8 x 1" bolts and flats to align panel supports **(Detail L)**, check the spacing of module end to center of cross rails **(Detail M)**, move in or out for 1/2 of the desired spacing between modules, add the bottom flat, lock washer and nut. Torque the 3/8 x 1" bolts to 20 ft-lbs (4) Places.
- B. Repeat for the right side.
- C. Lift next 4 modules up onto the panel supports; align mounting holes so the module edges are closest to the ends of the panel supports. Install with 1/4 x 3/4 bolts, flat and flange nuts. Torque to 84 in-lbs.
- D. Adjust spacing of center modules and Torque to 84 in-lbs.

Step 10: Install Knee Brace Channels LTP-LCR/120

- A. Install knee brace channel assembly (open side facing the pole), across the north side in the 4th hole in from the end of the panel supports with the 5/16-18 x 7/8" hardware (hex bolt, flat washer, and flange nut) to 144 in-lbs (dry). The ends of the knee brace channels will be the same distance in as the cross rails are to the panel supports.



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B. Repeat across the south side, Note: if installing the optional knee brace, go to **steps 11 and 12** first as this location can be moved in or out to allow for the proper knee brace angle to the array verses the angle set for the array.

Step 11: Adjust Tilt Angle

A. Remove the lower two 1/2-13 x 1.25" bolts from the tilt plates and tilt the array to desired angle, the array tilts in 10° increments from 0° to 50°. Re install 1/2-13 bolts and torque all six 1/2-13 bolts to 40 ft-lbs

Step 12: Install Optional Vee Brace LTP-LCR/120

PART NUMBER	DESCRIPTION	QTY.
51-0534-000	INNER CHANNEL	2
51-0534-001	OUTER CHANNEL	2
51-0610-015	INNER SWIVEL BRACKET	2
51-0610-020	OUTER SWIVEL BRACKET	4
51-07KB-600	Lower Knee Brace	1
23-0100-060	Bolt, U - 1/2-13 Zn for 6" pipe	1
25-5002-000	Washer, flat 1/2 Zn	2
25-5001-000	Washer, lock 1/2 Zn	2
24-5013-440	Nut, 1/2-13 fin hex Zn	2
23-3118-865	Bolt, Hex 5/16-18 x 3" SST.	7
23-3118-875	Bolt, Hex 5/16-18 x .875 SST	8
25-3102-000	Washer, flat 5/16" SS	15
25-2501-015	Nut, flange 5/16 SST	15

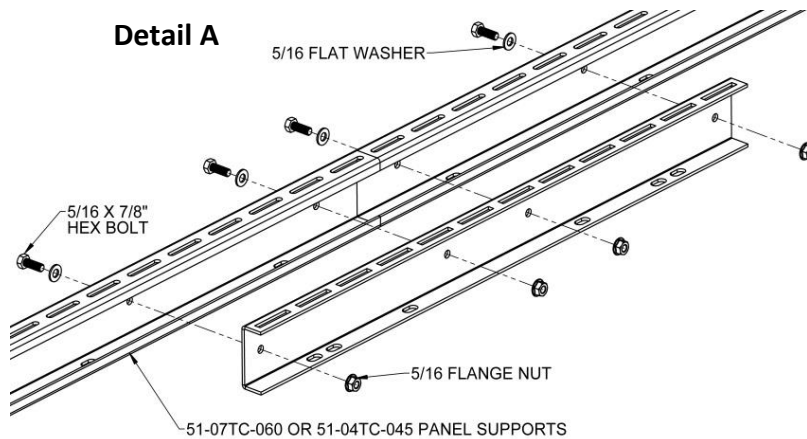


- Attach a knee brace channel on the south side of the array with the open side facing the pole (location to be determined by tilt angle) **(Detail N)**
- Attach the lower knee brace bracket loosely to the pole with the 1/2-13 x 6" U-bolt flat, lock and nut. **(Detail O)**
- Loosely attach the outer swivel brackets to the lower knee brace bracket (corner notch towards the pole), with 5/16-18 x3.0 bolt, flat washer and flange nut. **(Detail P).**
- Attach the outer swivel brackets to the knee brace channel at both ends (corner notch away from the pole) with 5/16-18 x 7/8 bolt, flat washer and flange nut. **Flange nut to be inside of the knee brace channel.** Tighten to 144 in-lbs (dry) **(Detail Q).**
- Loosely attach the inner swivel brackets to the outer swivel brackets on the knee brace channel. **(Detail R).**
- Loosely attach the outer 34.5" channels to the outer swivel brackets at the pole, open side facing in, with 5/16-18 x3.0 bolt, flat washer and flange nut. **(Detail S).**
- Loosely attach the inner 34.5" channels to the inner swivel brackets on the knee channel, open side facing in, with 5/16-18 x3.0 bolt, flat washer and flange nut. **(Detail T).**

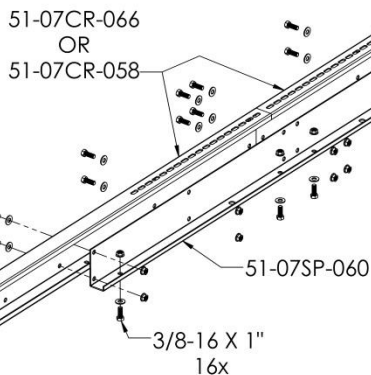
- H. Adjust the lower knee brace bracket up or down so the inner and outer 34.5" channel holes align with each other and install the 5/16-18 x 7/8 bolt, flat washer and flange nut at the hole nearest to each end of the inner and outer channels. **Note: there must be a minimum 6" overlap of the inner and outer channels.** Location of the knee brace channel can also be located up or down on the panel supports to maintain this and keep the brace as perpendicular as possible to the modules. Tighten all 5/16 hardware to 144 in-lbs (dry). **(Detail U).**

Detailed Diagrams for Assembly

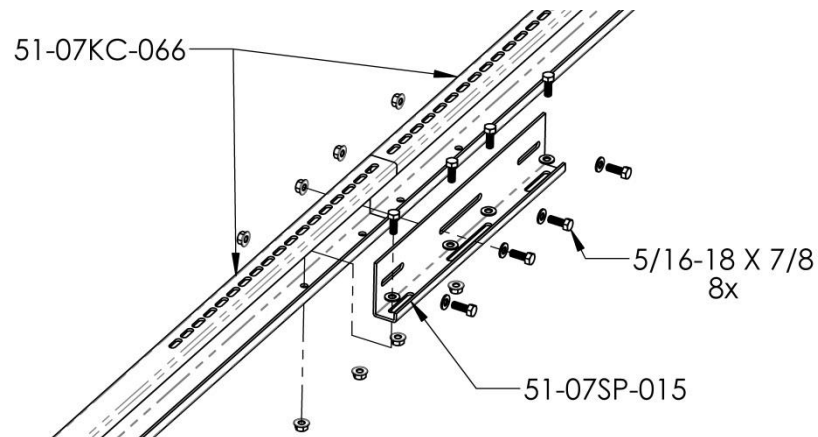
Detail A



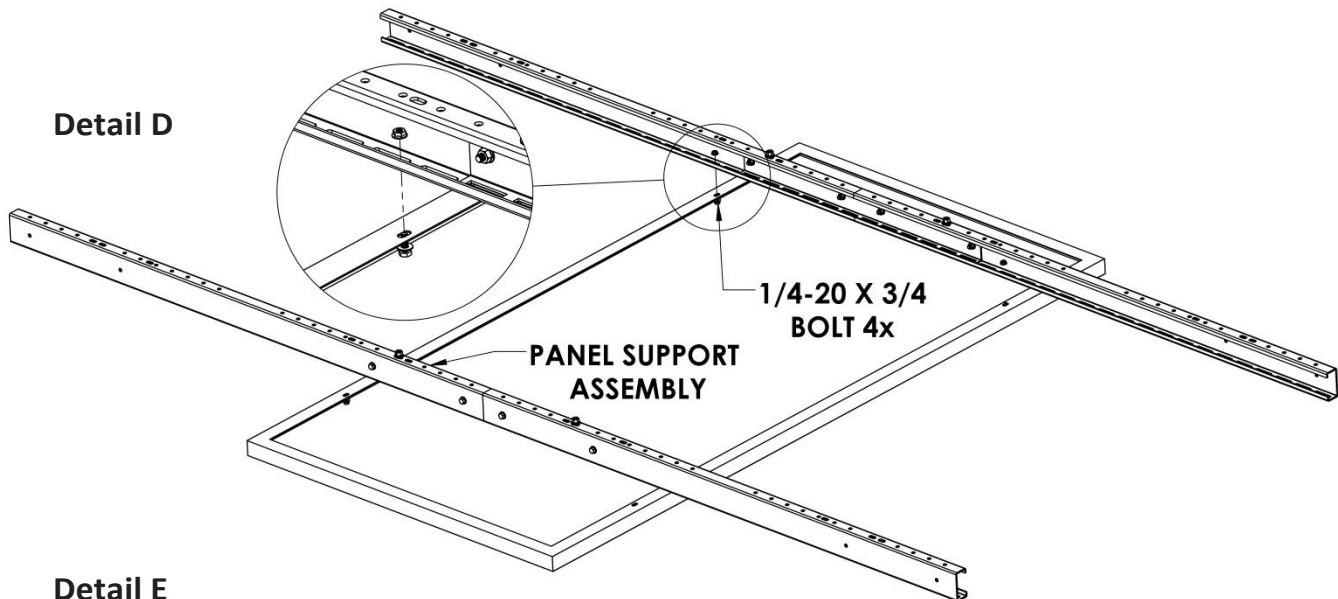
Detail B



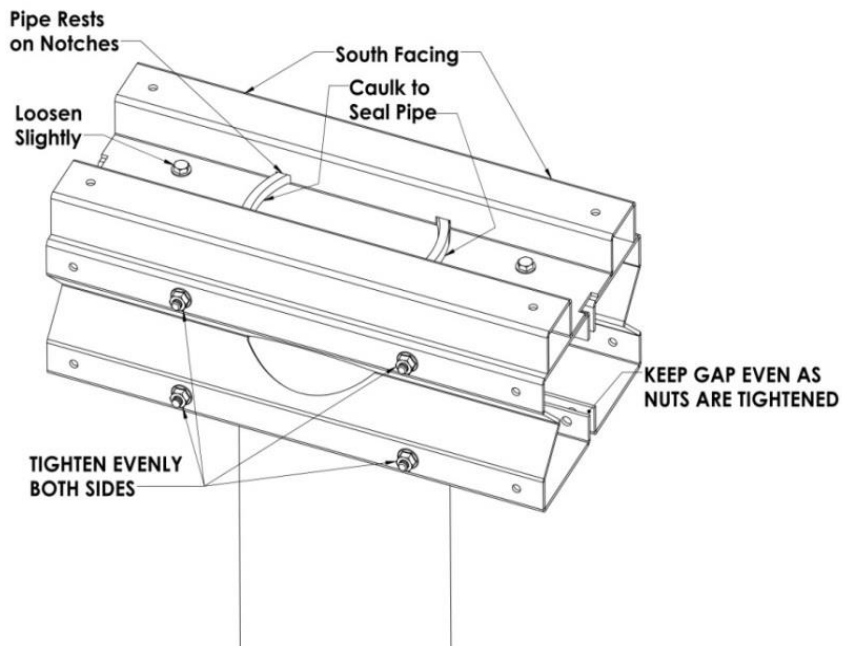
Detail C



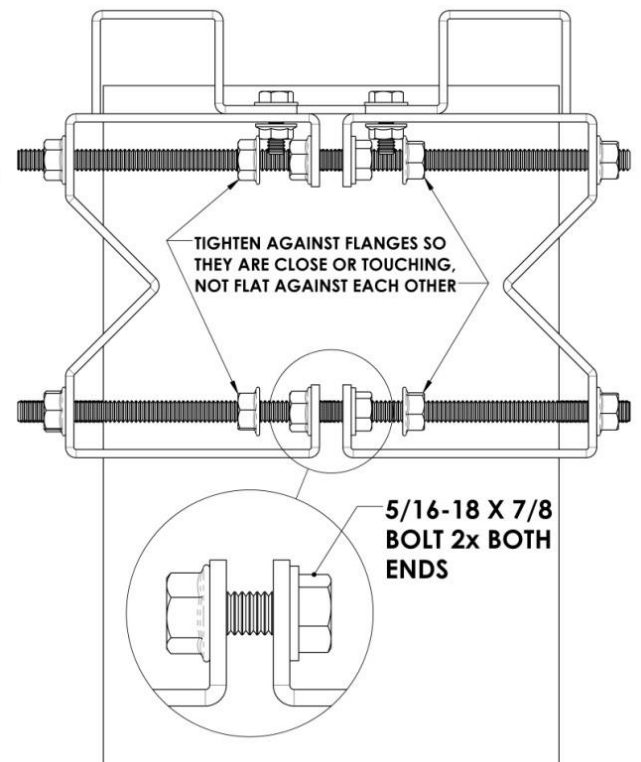
Detail D



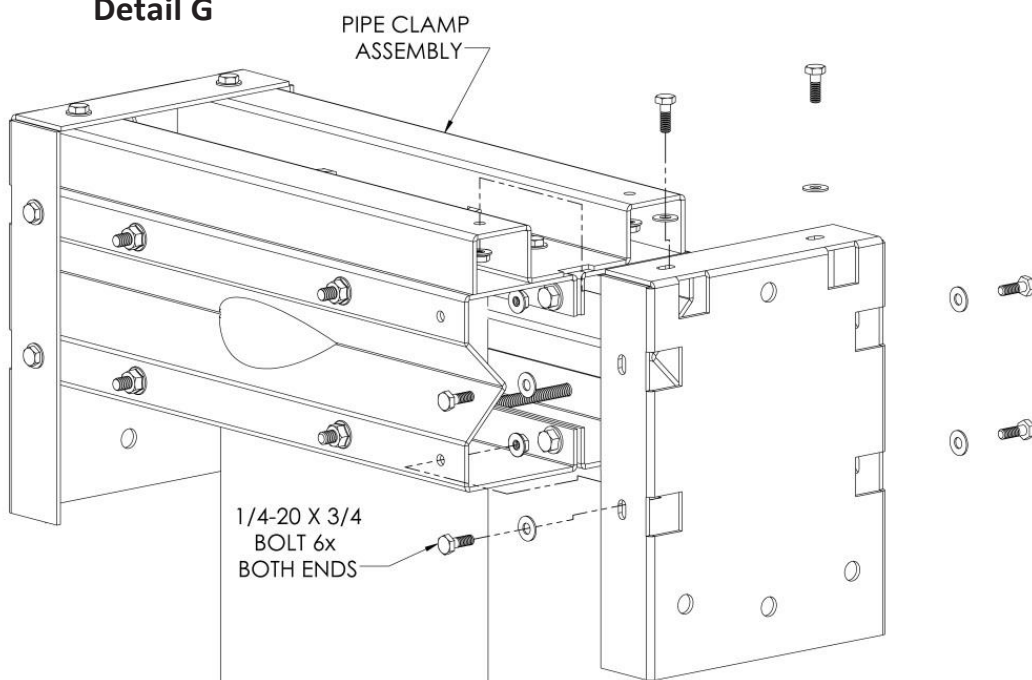
Detail E



Detail F



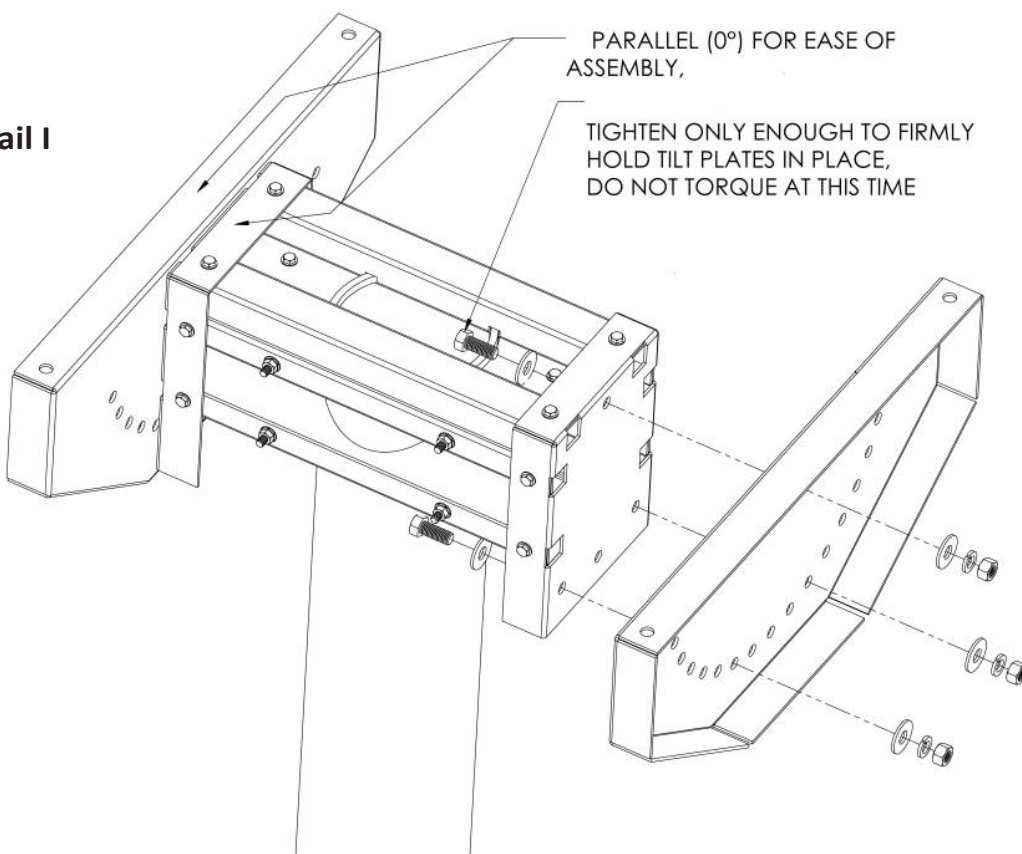
Detail G



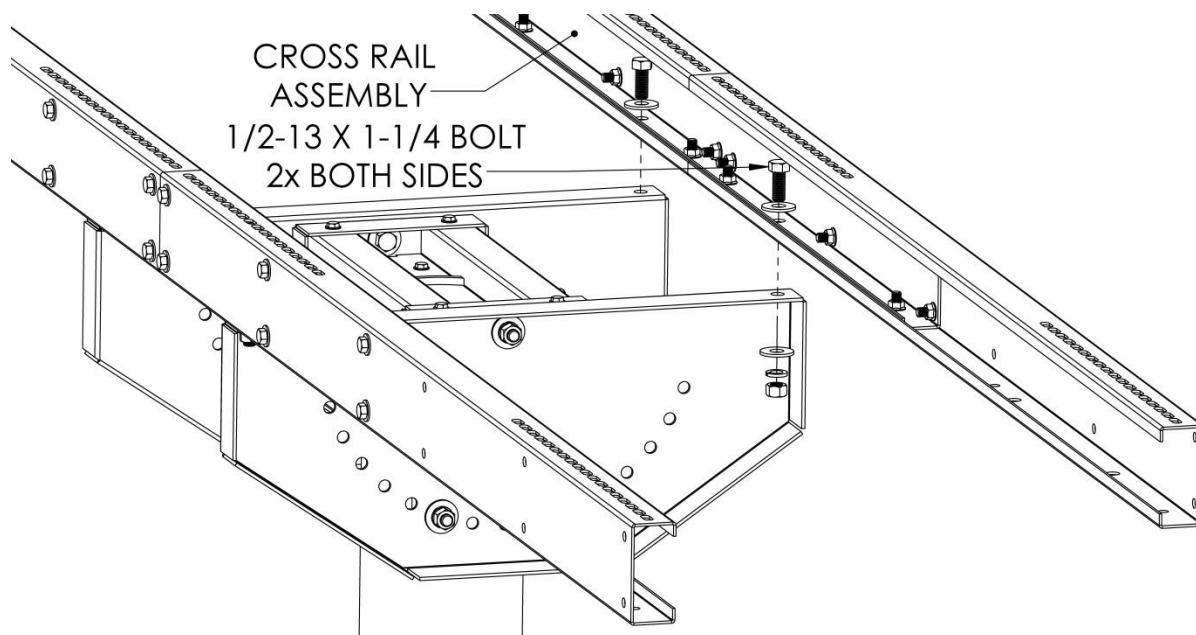
Detail H



Detail I



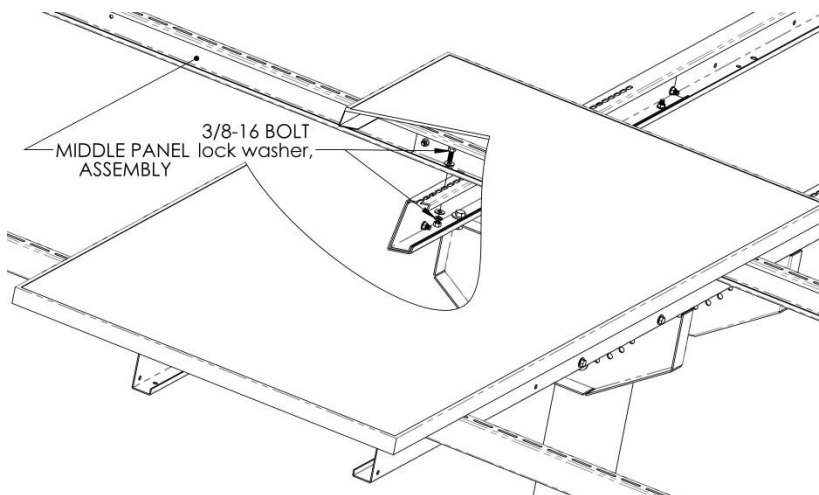
Detail J



DETAIL K

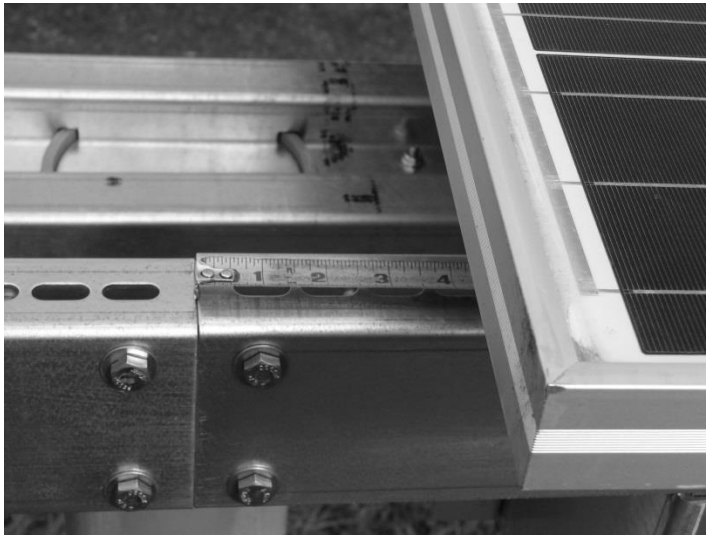


DETAIL L

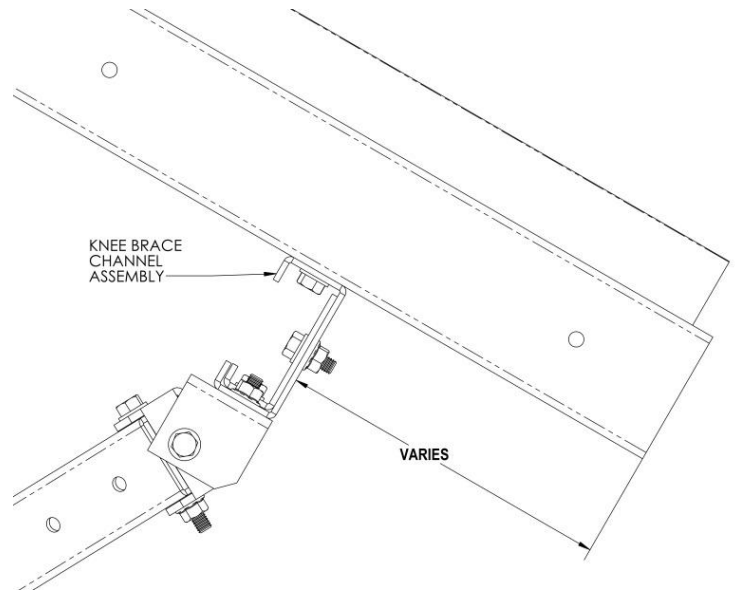


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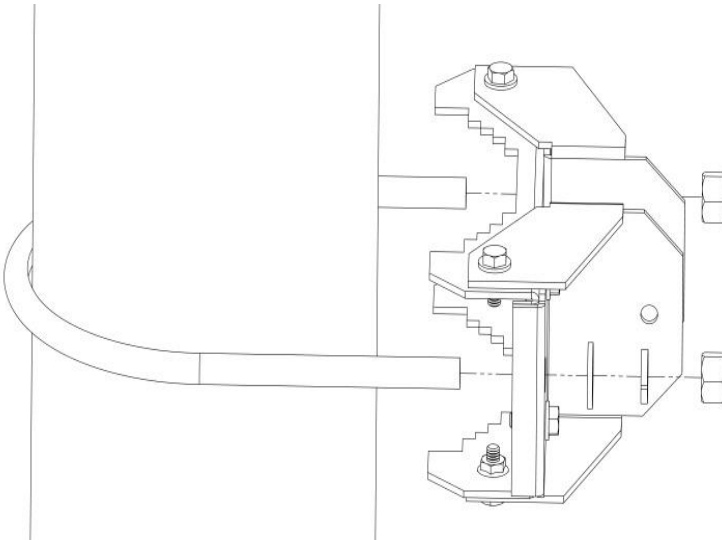
DETAIL M



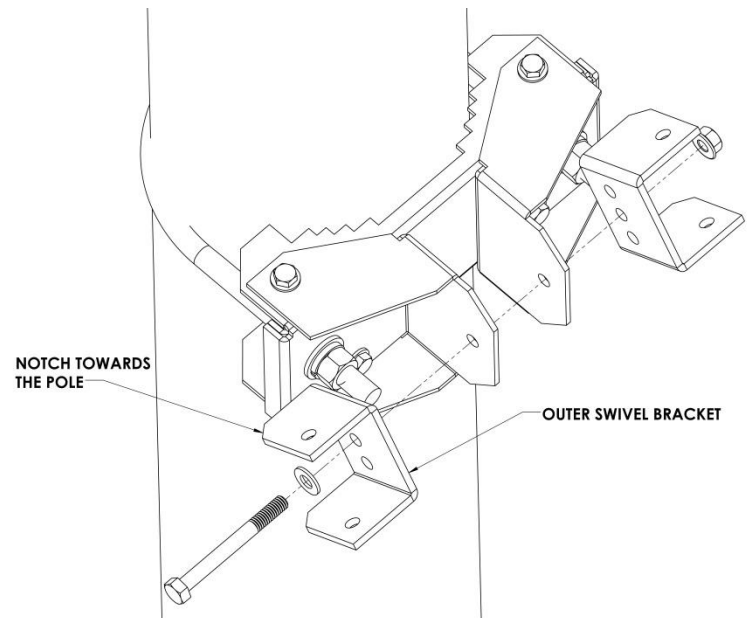
DETAIL N



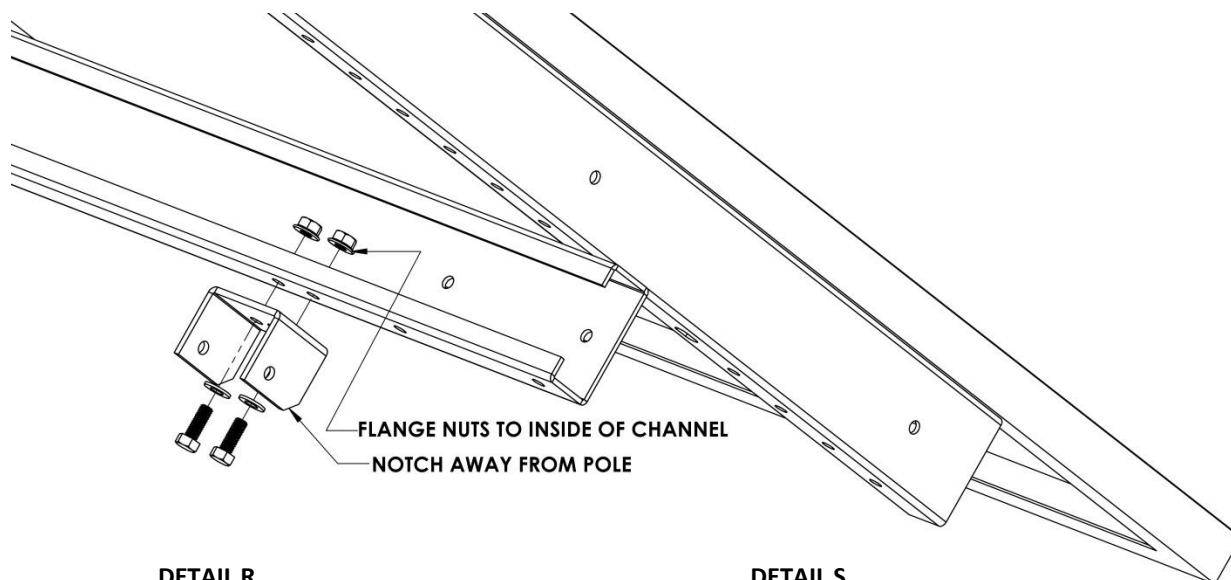
DETAIL O



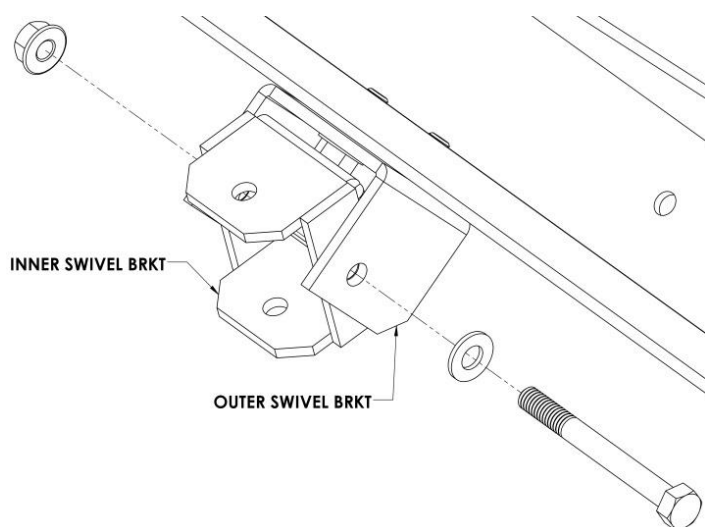
DETAIL P



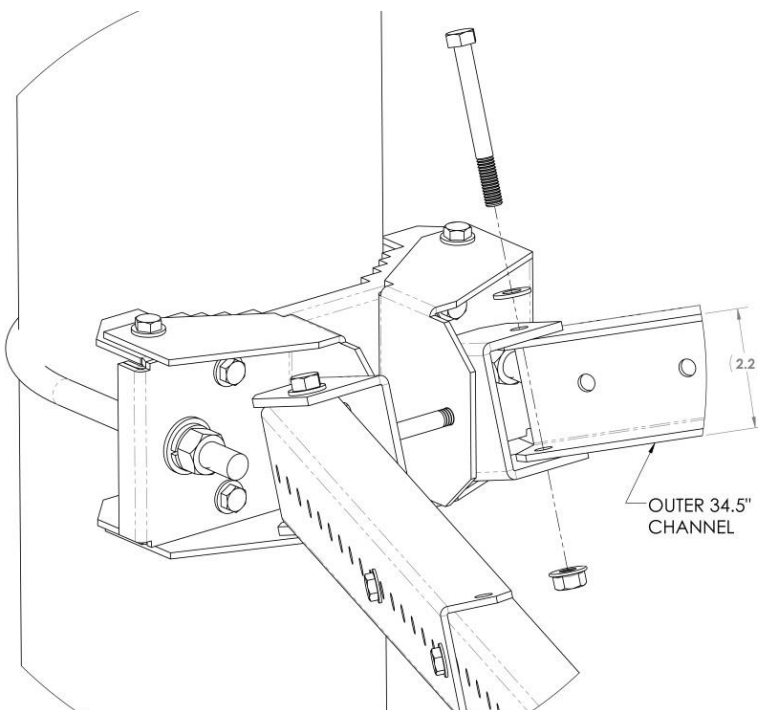
DETAIL Q



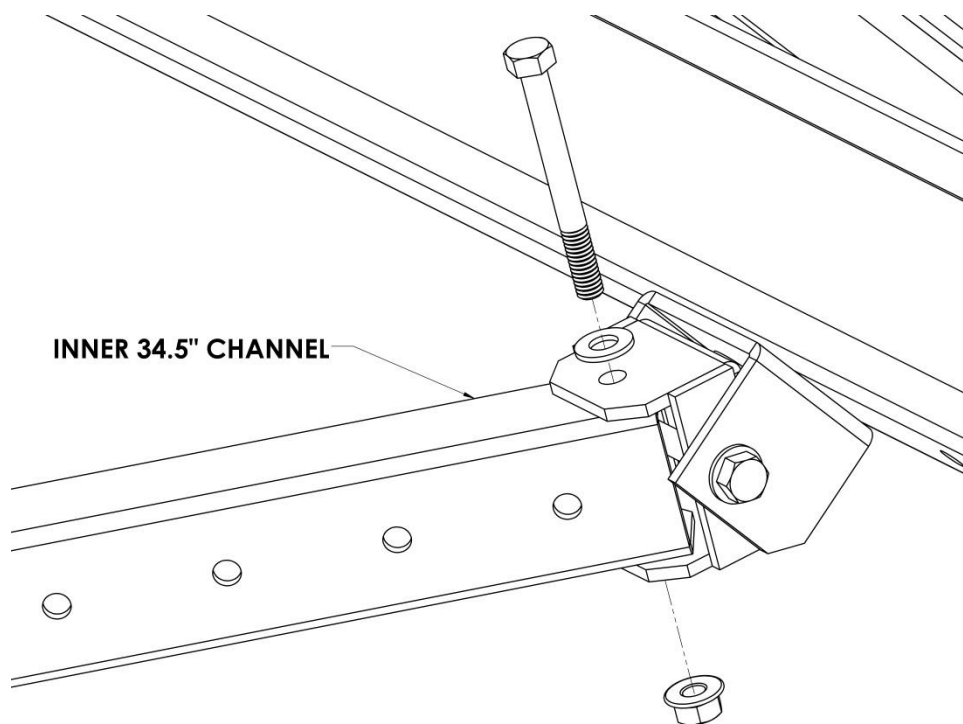
DETAIL R



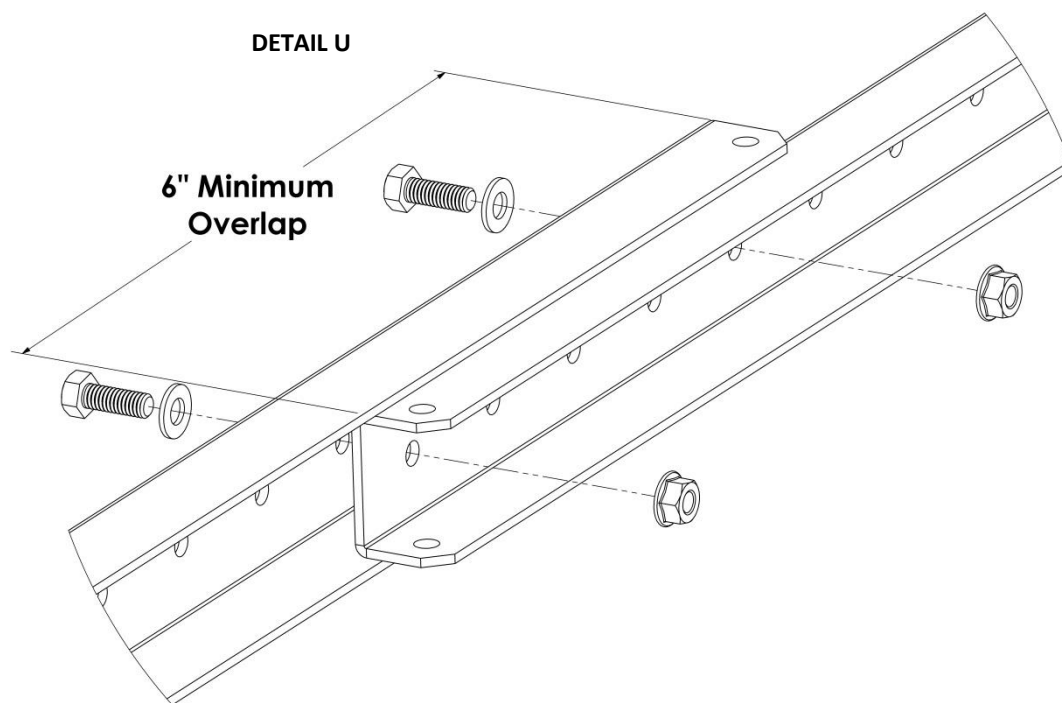
DETAIL S



DETAIL T



DETAIL U





Installer Responsibility

The installer is solely responsible for:

- i. Complying with all applicable local or national building codes, including any that may supersede this manual;
- ii. Ensuring that Tamarack Solar and other products are appropriate for the particular installation and the installation environment;
- iii. Using only Tamarack Solar parts and installer-supplied parts as specified by Tamarack Solar. Substitution parts may void the warranty;
- iv. Ensuring safe installation of all electrical aspects of the PV array; and
- v. Ensuring correct and appropriate design parameters are used in determining the design loading used for the specific installation. Parameters, such as snow loading, wind speed, exposure and topographic factor should be confirmed with the local building official or a licensed professional engineer.

Warranty Information

Tamarack Solar warrants each Mounting Structure to be free from defects in materials and workmanship for ten (10) years from the date of first purchase (“Warranty Period”), when installed properly and used for the purpose for which it is designed, except for the finish, which shall be free from visible peeling, or cracking or chalking under normal atmospheric conditions for a period of three (3) years, from the earlier of 1) the date the installation of the Product is completed, or 2) 30 days after the purchase of the Product by the original Purchaser (“Finish Warranty”). The Finish Warranty does not apply to any foreign residue deposited on the finish.

Galvanized coated sheet steel components will show rust on cut edges and is normal and will not affect the structure and function of the mount.

All installations in corrosive atmospheric conditions are excluded. The Finish Warranty is VOID if the practices specified by AAMA 609 & 610-02 – “Cleaning and Maintenance for Architecturally Finished Aluminum” (www.aamanet.org) are not followed by Purchaser for Tamarack Solar’s aluminum based products.

The warranty covers the replacement cost of parts to repair the product to proper working condition. Transportation and incidental costs associated with warranty items are not reimbursable. The warranty does not cover normal wear, or damage resulting from misuse, abuse, improper installation, negligence, or accident, or **typographical errors in instruction manuals**. The Warranty does not cover any defect that has not been reported in writing to Tamarack Solar within ten (10) days after discovery of such defect. Furthermore, it does not cover units that have been altered, modified or repaired without written authorization from the manufacturer or its authorized representative, or units used in a manner or for a purpose other than that specified by the manufacturer. Tamarack Solar’s entire liability and Purchaser exclusive remedy, whether in contract, tort or otherwise, for any claim related to or arising out of breach of the warranty covering the Mounting Structures shall be correction of defects by repair, replacement, or credit, at Tamarack Solar’s discretion. Refurbished Mounting Structures may be used to repair or replace the Mounting Structures

Tamarack Solar shall have no liability for any injuries or damages to persons or property resulting from any cause, whatsoever, or any claims or demands brought against Tamarack Solar by Purchaser, any employee of Purchaser, client of Purchaser, end-user of the Product or other party, even if Tamarack Solar has been advised of the possibility of such claims or demands (collectively, “Third Party Claims”). This limitation applies to all materials provided by Tamarack Solar during and after the Warranty Period.



Foundation Hole Guidelines

The suggestions below are recommendations only. It is the installer's responsibility to validate foundation parameters prior to installation, as local geotechnical report may be required to assess ground conditions. We recommend consulting with a local engineer familiar with local regulations and build site requirements, including soil conditions, terrain and load criteria (wind, snow, seismic). All of these parameters may impact foundation requirements.

Foundation Hole Guidelines Nominal Pipe Size 6" Schedule 40, 6' Above Grade				
Module Area	Max Wind Speed	Min. Hole Diameter	Min. Hole Depth	Min. Pole Depth
70	90MPH	24"	60"	54"
80	90MPH	24"	66"	60"
90	90MPH	24"	74"	68"
110	90MPH	24"	82"	76"

Installation Recommendations:

1. Auger hole to minimum depth shown in foundation guidelines.
2. The bottom 6" of hole should be filled with crushed rock or a blocking; this will prevent the pipe(s) from touching the base of the hole, insuring complete encapsulation of the pipe when concrete is poured, as well as allowing for water drainage.
3. The pipe(s) should be installed vertically no matter the slope of the install site.
4. Make arrangements to prevent the pipe(s) from twisting or moving prior to and during pouring of the concrete.
5. The pipe(s) should be braced to remain plumb and in position until concrete has cured at least 24hrs

